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the last chapter, and will be found of much assistance as an introduction to the physiological part of the volume.

In point of illustration, this stands in marked contrast with the more recent American text-books on related subjects. If the figures do not all possess the highest artistic merits, they are for the most part well executed. Their chief value, however, lies in the fact that very few of them have before appeared in American books. Sachs, which has supplied most of our later text-books with their only meritorious histological illustrations, has been practically discarded. While most of the cuts are copies, many of them are taken from special memoirs not readily accessible to the majority of teachers, and hence are as useful as if original; and those that have been reproduced from other sources have the merit of excellence of execution and ready comprehensibility.

If the closing part of the volume, dealing with vegetable physiology, which, as we understand, is soon to appear, shall maintain the character of that already published, the book cannot fail to meet the requirements of the class of botanists for whom the 'Botanical text-book' was planned.

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#### DISEASE-GERMS.

DR. KLEIN'S book is by far the best we have seen on the subject of the pathogenic and septic bacteria. The author has had a thorough practical education in the matter, as he has worked at it experimentally during the last ten years for the medical department of the local government board of England. In this little volume are embodied his own researches, supplemented by those of others, arranged to form an admirable guide, either for those who may wish to work in this field practically or for those who may wish to get merely a critical knowledge.

The first five chapters are devoted to the apparatus and methods employed in the cultivation of bacteria outside of the body, and the precautions which are necessary in order to avoid error. Also the inoculation of animals, and the care to be taken in this, are spoken of here.

An exhaustive account of the morphological

characters of all the micro-organisms is not attempted, but only of such as are related to disease in some way or other.

The classification of Cohn is followed; and the micrococci are first taken up, then the bacteria proper, after this the bacilli, then the vibrios and spirilli, and finally the fungi, including actinomycetes.

The descriptions of the appearance and characteristics of the various species are greatly aided by woodcuts giving the shape and particular way of grouping together. The difference in outline between many of the bacteria is so slight that it cannot be attained in the most highly executed plates: therefore it is much better to try to represent their method of association, and the abundance in which they occur in the tissues, than to strive for great accuracy in the delineation of individuals. The last chapters of the book are well worth reading, as they deal with some of the general questions. That on the relations of septic to pathogenic organisms considers the possibility of certain of the former assuming the properties of the latter under extraordinary conditions. Three examples have been brought forward as proof of this: first, the transformation of the hay bacillus into the bacillus anthracis; second, the properties of exciting inflammation in the eye, which the bacillus subtilis of the air is said to assume when grown in a solution of jequirity-bean (*Abrus precatorius*); and, third, that the common aspergillus, when cultivated under peculiar conditions, is reported to be fatal when inoculated into rabbits. The facts bearing on these cases are carefully reviewed and tested by his own experiments, and he comes to the conclusion that in each case there is an error. In the first it arises from the accidental contamination of the nutritive fluid; in the second it is not the microbe which is the active agent, but a peculiar chemical ferment (abrin) which is contained in the beans, and has also been obtained from other parts of the plant; and in the third the fungus acts simply mechanically, and not as a toxic agent, in causing death. The septic alkaloids (ptomaines) and the zymogenic ferments are noticed in the chapter on the vital phenomena of non-pathogenic organisms. He takes up the subject of vaccination and immunity, and concludes that the weight of evidence tends to show that the milder form of disease furnishes some substance, not as yet demonstrated, in addition to those already in the system, which acts in preventing the development of the severer forms. In the last chapter, attention is directed to antiseptics;

*Micro-organisms and disease.* An introduction into the study of specific micro-organisms. By E. KLEIN, M.D., F.R.S. London, Macmillan, 1884. 8°.

*The formation of poisons by micro-organisms.* A biological study of the germ theory of disease. By G. V. BLACK, M.D., D.D.S. Philadelphia, Blakiston, 1884. 12°.

and it is shown that the greater number simply hinder the development of bacteria, and in no way destroy their powers when they are again placed under suitable conditions.

The little volume may be summed up as clear and concise, well illustrated, and inexpensive.

Dr. Black has adopted a rather high sounding title for a course of lectures delivered to the students in the Chicago college of dental surgery. There is no evidence that he has worked practically at the subject, and the generalizations to which he is inclined have to be made entirely upon the work of others which he has not controlled. He thinks that all the processes causing cell destruction or absorption are a sort of digestion, and that micro-organisms act by digesting the cells, or else they are digested by them. Perhaps, if the subject-matter had been a little more digested by the author, he would not have felt himself called upon to publish these lectures.

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#### BILLINGS'S VENTILATION AND HEATING.

THIS book is a reprint, in revised form, of a series of articles which appeared in *The sanitary engineer* in answer to a typical questioner who asked for a rule-of-thumb method for solving problems in ventilation, and who failed to recognize the legitimate relation between 'long-winded discussions on the physics of gases,' and ventilation. The author urges a thorough knowledge of the mechanics of gases, and of the laws involved in their free and constrained movement, as essential to any competent judgment upon the solution of the various pneumatic and thermal problems peculiar to heating and ventilation.

Pecuniary rather than constructive or functional difficulties are stated to be the most serious encountered in providing good ventilation. A partial antidote for scepticism as to the efficiency of any method, because of the frequent entire or partial failure of elaborate and costly systems put to the test of actual use, appears in the description given of systems in successful operation in various types of buildings. If the causes of failure in less successful undertakings had been clearly pointed out, the faith of many would have been still further strengthened. A discussion of the comparative cost of heating, with and without conjoined ventilation, would also have served the good

purpose of furnishing needed information, and of allaying any undue apprehension growing out of the author's statements which make ventilation dependent on liberality of expenditure. The ordinary cost of ventilation does not necessarily represent the minimum cost under conditions of maximum economy and efficiency; and it is along these lines that the progress is to be made which shall inspire confidence, and create demand.

The book is a valuable contribution to the literature, rather than to the science, to which it pertains. It furnishes a clear statement of the fundamental principles involved in the art of heating and ventilation, and describes its methods and results in their application to the numerous and varied illustrations cited. In style, the book is fresh, vigorous, and perspicuous; the occasional flashes of the author's individuality lending a charm the more complete because unmarred by dogmatism. Though occasional statements may provoke marginal interrogation-points, the book is an eminently safe guide, and easily takes a leading place among the works of its kind which have appeared in American literature.

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#### NOTES AND NEWS.

It is suggested by G. P. Putnam's sons of New York to secure for the publications of societies the same advantages that are possessed by the issues of publishers, by having them fully described in a priced and classified catalogue, to be made up, say, twice a year, and to be distributed as widely as are the book-lists of publishing-houses. There are at present in the United States some seventy scientific and historical associations which issue in the course of the year transactions, proceedings, or monographs. Many of these publications possess an interest and importance for the general public, and find sale outside of the special circles of the members of the societies for whom they are more particularly prepared. The general sale of such society publications could be materially increased, to the advantage as well of the special interests they are planned to further, as of the various publication-funds, if provision were made for some trustworthy means by which the general public might secure prompt information concerning the works issued, and for some regular channel through which could be supplied the increased demand that such information would unquestionably induce. Each society whose publications are included in the catalogue, will, under the plan proposed, contribute a small annual payment towards the cost of its preparation, while the publishers will assume the payment of such deficiency as may remain.

— D. G. Brinton of Philadelphia announces as in press "The Lenapé, and their legends; with the com-

*Ventilation and heating.* By J. S. BILLINGS. New York, *The sanitary engineer*, 1884. 8<sup>s</sup>.